DETAILED DESCRIPTION

[Detailed Description of the Invention]
[0001]
[Field of the Invention]This invention relates to a resin filling service-water aluminum oxide which gives fire retardancy to an interior material, an electron, the housing of an electric appliance, and other resin-molding objects, and a manufacturing method for the same. Fire retardancy sufficient more particularly for the resin-molding object filled up with this aluminium hydroxide is made to give, and the handling at the time of processing is easy, and it is related with a resin filling service-water aluminum oxide which presents the surface disposition excellent in the Plastic solid acquired, and a manufacturing method for the same.
[0002]
[Description of the Prior Art]In recent years, by remarkable progress of petrochemistry and organic high polymer chemicals, in our life space, a polymer material serves as various necessaries and exists. For example, thermoplastics, such as polyethylene, polypropylene, and VCM/PVC, is used widely the covering material of interior materials, such as a carpet in a car or a house, and lining, TV, a personal computer, other electric products, and an electric wire, etc. However, since these polymer materials have the character which emits an elevated temperature and burns like common knowledge, also when a lot of [when a fire once breaks out / not only force-of-fire expansion but] smoke, poisonous gas, corrosive gas, etc. are emitted, more outstanding flameproofing and incombustibility-ization are demanded from a viewpoint on safety and accident prevention from a certain thing.
[0003]Although many measures against flameproofing have been taken against the polymer material used for this use from this point, the trend of the latest fire-resistant regulation is not only the material which cannot burn easily, but to be hard to generate poisonous gas, a thing [low fuming nature], etc. are demanded.
[0004]For this reason, although halogen series flame retardants, such as Br system and Cl

system, have been conventionally developed by the subject to flameproofing of a polymer material, This halogen series flame retardant is gradually shunned from the field of fuming nature and poisonous gas generating, and development of inorganic flame retardants, such as metal hydroxide which is low venenosity as what is replaced with this, and has an emitting smoke control function, tin oxide, antimony oxide, way acid chloride, and phosphorus compounds, etc. is performed briskly.

[0005]Especially, aluminium hydroxide demonstrates a fire-resistant effect from both sides of the endoergic reaction accompanying heating, and dehydration, and does not have generating of poisonous gas, either, and it is fire retardant with high safety. Furthermore, it carries out by knowing having many advantages, such as there being also emitting smoke depressor effect with high specific surface area, and it being at a low price and chemically stable as compared with other metal hydroxide, and being, and the drying output of aluminium hydroxide is **. However, in order to give sufficient fire retardancy for resin, it is necessary to add so much, and in carrying out restoration mixing of the aluminium hydroxide of the grade which gives desired fire retardancy, it has a fault, such as spoiling the original outstanding molding workability of resin.

[0006]The art of performing a surface treatment to an inorganic bulking agent is already publicly known as a means to secure fire retardancy, without spoiling the original outstanding molding workability of resin, etc. For example, the method of filling up with a silane coupling agent into EVA the inorganic hydrate etc. which carried out the surface treatment is indicated by JP,61-264034,A.

[0007]However, although the fire retardancy of a Plastic solid and the mechanical strength which are obtained from this resin composition improve in a described method, The mobility of the resin composition under heating was insufficient, molding workability was bad, addition drugs, such as resin and a finishing agent, deteriorated by generation of heat produced in the mixing step etc. which require high torque, and there was a problem of a Plastic solid coloring.

[0008]On the other hand, the technique of decreasing the fill ration of metal hydroxide by adding a fire-resistant auxiliary agent, and aiming at improvement in a mechanical strength is also known. For example, the method of blending with ethylene propylene rubber or ethylene butene-1 rubber the particle aluminium hydroxide which performed the surface treatment with fatty acid or fatty acid metal salt, and red phosphorus at JP,62-218432,A, In JP,61-130370,A, the method of carrying out 3-50 weight-section restoration of any they are among 50 - 100 weight section, ******, zinc borate, and a titanium dioxide, etc. are indicated in $Mg(OH)_2$ or $aluminum(OH)_3$ at polyolefine 100 weight section.

[0009]However, when the Lynn system compounds, such as ******, are used for a fire-resistant auxiliary agent like the above, at the time of combination work, work environment stricter than it is generated by dust and authorized personnel's health may be injured is required, and in

order to attain this, it has a fault, such as causing increase of manufacturing facility expense.
[0010]
[Problem(s) to be Solved by the Invention]When the purpose of this invention filled up resin, especially thermoplastics with aluminium hydroxide and it is used as a resin composition, The fire retardancy excellent in the Plastic solid acquired with this resin composition even if it did not add other fire-resistant auxiliary agents at all other than aluminium hydroxide is shown, And a resin filling service-water aluminum oxide which presents the surface disposition excellent in the Plastic solid which is excellent in the handling nature at the time of a fabricating operation, and which is both acquired using this resin composition, and a manufacturing method for the same are provided.
[0011]The result wholeheartedly examined so that this invention persons may find out the resin filling service-water aluminum oxide with which it is satisfied of the above-mentioned purpose in view of the bottom of this situation, When it has the second [an average of] particle diameter and Na concentration below a specific range and specific resin is filled up, the aluminium hydroxide which shows specific mobility may satisfy all the above-mentioned purposes, This aluminium hydroxide finds out being obtained using the aluminium hydroxide which has physical properties specific as a raw material by giving this, combining specific operation, such as grinding and the partial dissolution, two or more kinds, and came to complete this invention.
[0012]
[Means for Solving the Problem]Content Na concentration this invention by Na_2O conversion

Namely, 0.3 or less % of the weight, When the second [an average of] particle diameter is 10 micrometers or less and a melt flow rate (it may be written as MFR below) is filled up with 150 weight sections to thermoplastics 100 weight section which are 0.80g/10 minutes, It is in providing a resin filling service-water aluminum oxide, wherein MFRs of a resin composition after this resin filling are 0.55g/10 minutes or more.
[0013]Furthermore, content Na concentration this invention by Na_2O conversion 0.3 or less %

of the weight, Aluminium hydroxide which is not ground [which was obtained with a Bayer process whose first / an average of / particle diameter is 0.5 micrometer - 15 micrometers, and whose second / an average of / particle diameter is 0.5 micrometer - 60 micrometers], It grinds using a bulk crushing machine until it becomes a range in which these second [an average of] particle diameter is 10% - 90%, In subsequently, the range whose second [an average of] particle diameter after grinding surface grinding according aluminium hydroxide after grinding to grinding further is performed, and is 60% - 99% of the second [an average of] particle diameter in front of surface grinding. And by grinding so that it may be 1.2 to 5 times the BET specific surface area before a BET specific surface area after grinding grinding, In Na_2O

conversion, content Na concentration is 0.3 or less % of the weight, and the second [an average of] particle diameter is 10 micrometers or less, When MFR is filled up with 150 weight sections to thermoplastics 100 weight section which are 0.80g/10 minutes, MFR of this restoration constituent is to provide a manufacturing method of a resin filling service-water aluminum oxide which are 0.55g/10 minutes or more.

[0014]After this invention furthermore grinds aluminium hydroxide whose second [an average of] particle diameter is 0.5 micrometer - 30 micrometers until it becomes a range whose second [an average of] particle diameter after grinding is 10% - 90% using a dry type impact grinder, Alkali concentration in an equilibrium situation adds and slurs aluminium hydroxide after this grinding by Na_2O conversion at 20 ** - 80 ** to an ulmin acid alkali solution which are 1 mol/l - 10 mol/l, Subsequently, by making a BET specific surface area of aluminium hydroxide after adding to an ulmin acid alkali solution fall to this solution 70 to 95% rather than addition before by carrying out 10 ** - 70 ** temperature up of this slurry, In Na_2O conversion, content Na concentration is 0.3 or less % of the weight, and the second [an average of] particle diameter is 10 micrometers or less, When MFR is filled up with 150 weight sections to thermoplastics 100 weight section which are 0.80g/10 minutes, MFR of this restoration constituent is to provide a manufacturing method of a resin filling service-water aluminum oxide which are 0.55g/10 minutes or more.

[0015]

[Embodiment of the Invention]Hereafter, this invention is explained still in detail. The outstanding handling characteristics at the time of the fabricating operation of a resin composition in which this invention carried out aluminium hydroxide restoration from many experiments, In order to attain the purpose that the surface disposition which the Plastic solid acquired by processing this resin composition revealed sufficient fire-resistant effect, and was excellent is revealed, When it has the Na concentration below the second [an average of] specific particle diameter and a specific amount and specific resin is filled up, That it must be aluminium hydroxide which shows the mobility more than specification, and the aluminium hydroxide which has these physical properties, It finds out being obtained using the aluminium hydroxide which has physical properties specific as a raw material by giving this, combining specific operation, such as grinding and the partial dissolution, two or more kinds, and completes.

[0016]As for the second [an average of] particle diameter of the resin filling service-water aluminum oxide of this invention, about 10 micrometers or less are indispensable, and it is about 0.1 micrometer - about 5 micrometers more preferably about 0.1 micrometer - about 10 micrometers. When the second [an average of] particle diameter of aluminium hydroxide exceeds about 10 micrometers, the mechanical strength fall of the Plastic solid acquired from this resin composition and particles appear in a molded body surface, and cause an

appearance defect. When it is a particle, a maldistribution is produced, and a mechanical-strength fall and appearance defect of a Plastic solid may be caused similarly.

[0017]As for about 0.01 - 0.2 % of the weight of abbreviation, as a resin filling service-water aluminum oxide of this invention, about 0.01 - the thing of 0.15 % of the weight of abbreviation are more preferably used for content Na concentration about 0.3 or less % of the weight by Na_2O conversion. When this content Na concentration exceeds about 0.3 % of the weight, since heat resistance falls, a pyrolysis is occurred at the time of processing of a resin composition and fire retardancy falls, it is not desirable.

[0018]As for the aluminium hydroxide used in this invention, it is indispensable that MFRs of the resin composition in which MFR was filled up with this 150 weight sections of aluminium hydroxide to thermoplastics 100 weight section which are about 0.80g/10 minutes are about 0.55g/10 minutes or more. When MFRs of this resin composition are about 0.55g/less than 10 minutes, the surface disposition and mechanical strength of a Plastic solid which are obtained by the molding workability of this resin composition getting worse fall. The thermoplastics used for measurement of MFR was not restricted in particular, when MFR was thermoplastics which is about 0.80g/10 minutes, but in this invention, ultra low density polyethylene (the Sumitomo Chemical [Co., Ltd.] make, a brand name: EKUSEREN VL, VL100) was used for it.

[0019]Resin with usually publicly known aluminium hydroxide with which it is satisfied of all these physical properties, for example, polyethylene, An ethylene propylene copolymer, ethylene and a vinyl acetate copolymer, An ethylene butene copolymer, ethylene acrylate copolymers, polypropylene, The polymer or copolymers of styrene, such as polystyrene, ABS, AAS, and AES, About 50 or more weight sections are ordinarily applicable to about 100 or more weight sections and also the use large as a flame retardant resin composition filled up with abbreviation 150- about 400 weight sections to thermoplastics 100 weight sections, such as a methacrylic acid polymer.

[0020]On the occasion of this aluminium hydroxide use, a surface treatment may be performed if needed. Although the drugs in particular that perform a surface treatment are not limited, generally Stearic acid, Fatty acid ester, such as fatty acid, such as oleic acid, and fatty acid metal salt, and butyl stearate, Copolymers, such as various coupling agents, such as a silane coupling agent, a titanate coupling agent, and an aluminate coupling agent, maleic acid, an olefin, alkyl-phosphoric-acid ester, and its metal salt are used. Alkyl-phosphoric-acid ester and its metal salt are especially desirable.

[0021]Especially if the manufacturing method of aluminium hydroxide of this invention is a method by which what has the above-mentioned physical properties is obtained, it is not limited, but it can be obtained, for example by the following methods. As the one manufacturing method, the first [an average of] particle diameter that is not ground [which was obtained with the Bayer process] as raw material aluminium hydroxide first About 0.5

micrometer - about 15 micrometers, About 0.5 micrometer - about 10 micrometers of about 0.5 micrometer - about 5 micrometers, and the second [an average of] particle diameter are about 1 micrometer - about 10 micrometers preferably, [about 0.5 micrometer - about 60 micrometers of] [about 1 micrometer - about 30 micrometers of] Content Na concentration preferably about 0.3 or less % of the weight by Na_2O conversion About 0.01 - 0.2 % of the weight of abbreviation, More preferably, using about 0.01 - aluminium hydroxide of 0.15 % of the weight of abbreviation, using a bulk crushing machine, about 10 - 90% of abbreviation grind this until the second [an average of] particle diameter of this raw material aluminium hydroxide becomes about 15 - 85% of abbreviation preferably. The aluminium hydroxide obtained by the Bayer process as the above-mentioned raw material aluminium hydroxide is mentioned. An impact grinder which is usually regarded as a bulk crushing machine by the 1283rd page - No. 1292 with a chemical engineering manual revision of edition [4th], A ball mill, a vibration ball mill, a special ball mill, a jet pulverizer, etc. are pointed out, As a commercial item, jet pulverizers, such as special ball mills, such as impact type pulverizers, such as a super micron mill, contraplex one, and a pulverizer, a planet form grinder, APEX Mill, a high-speed-steel wing ball mill, and a tower mill, a jet mizer, and a jet mill, etc. are mentioned. Aluminium hydroxide after grinding performs grinding by the grinding method further with a bulk crushing machine, About 60% - about 99% of the second [an average of] particle diameter before the second [an average of] particle diameter after grinding grinding (after wet medium mill grinding). It is about 65% - about 99% of range preferably, and about 1.2 of the BET specific surface area before the BET specific surface area after grinding grinding - 5 times as many abbreviation grind so that it may become about 1.2 - 3.5 times as many abbreviation preferably.

[0022]In the above-mentioned manufacturing method, when the first [an average of] particle diameter of raw material the unground aluminium hydroxide with which bulk crushing is presented is less than about 0.5 micrometer, desired mobility is not obtained, but when larger than about 15 micrometers of another side, a strain goes into a primary particle at the time of grinding, and heat resistance falls. When the second [an average of] particle diameter is less than about 0.5 micrometer, the particles the efficiency of comminution indicates desired mobility to be bad are difficult to get, and since great energy is needed in order that the second [an average of] particle diameter may obtain particle of about 10 micrometers or less in the case of large particles which exceed about 60 micrometers, it is not desirable.

[0023]In this method, the grinding effect in a bulk crushing machine appears in broadcloth-ization of particle size distribution, and when optimal grinding is performed, the granular material which has the particle size distribution with which it can be filled up high-density is obtained. When it is less than 10% of the particles before the second [an average of] particle diameter of aluminium hydroxide after grinding grinding in a bulk crushing machine, it becomes

overgrinding and the heat resistance of a grinding article falls. On the other hand, when the particle diameter after grinding is larger than 90%, probably because the particle size distribution which enables minute restoration is not acquired, the fill ration to the inside of resin falls. As apparatus used for grinding, a thunder crushing machine, a decanter, etc. are usually mentioned. The mobility at the time of specific surface area increasing to less than 60% of case as compared with the second [an average of] particle diameter before grinding, and the grade of grinding by grinding filling up resin not only gets worse, but heat resistance falls. When the particle diameter after grinding exceeds 99%, probably because the particle size distribution which enables minute restoration is not acquired, the fill ration to the inside of resin falls, the surface disposition of a Plastic solid is satisfied, and the resin filling service-water aluminum oxide to which a desired fire-resistant effect can be made to give is not obtained.

[0024]As the second manufacturing method, the second [an average of] particle diameter About 0.5 micrometer - about 30 micrometers, The second [an average of] particle diameter after grinding preferably aluminium hydroxide (about 1 micrometer - about 10 micrometers) using a dry type impact grinder About 10% - about 90%, After grinding until it becomes about 15% - about 85% of range preferably, the alkali concentration in an equilibrium situation adds and slurs aluminium hydroxide after this grinding by Na_2O conversion at about 20 ** - about 80 ** to the ulmin acid alkali solution which are about 1 mol/l - about 10 mol/l, subsequently, the thing to do for about 10 ** - the about 70 ** temperature-up processing (however, below the boiling point) of this slurry -- BET specific surface area of aluminium hydroxide after adding to ulmin acid alkali solution addition-in this solution-before -- about 70- about 95% -- desirable -- about -- you make it able to fall 80-about 90%, and it can manufacture. As a dry type impact grinder, a jet mill grinder is common, and a counter jet mill, a supersonic jet mill, etc. are used as a commercial item.

[0025]The resin filling service-water aluminum oxide of this invention can be obtained with a described method. Although it is obtained by doing in this way and the method in particular of the drugs processing to the aluminium hydroxide surface is not limited, either, For example, drugs are added to aluminium hydroxide which is in suspended state voice in carrier fluid, the method of drying, after fully carrying out an agitation mix -- beforehand, drugs to water, an organic solvent, etc., the dissolution or after carrying out uniform dispersion, How to mix and dry using a Henschel mixer, Werner, a ribbon blender, etc. with aluminium hydroxide, The method of using blenders, such as a super mixer, for dry aluminium hydroxide, and carrying out dry processing of the drugs or aluminium hydroxide is ground, drugs are added at the time of particle size preparation, and the method of applying and carrying out the surface treatment of MEKANOKEMIKARU, etc. are taken.

[0026]

[Effect of the Invention]The resin filling service-water aluminum oxide of this invention

explained in full detail above, When filling up resin, especially thermoplastics and using it as a resin composition, The Plastic solid acquired even if it did not add other fire-resistant auxiliary agents at all other than aluminium hydroxide of this invention, it can be filled up with aluminium hydroxide of the quantity which reveals the outstanding fire retardancy, without spoiling the outstanding surface disposition and mechanical strength -- possible ** -- it is -- it is ** and the industrial value including safety, workability, or a price being cheap etc. is size very much.

[0027]

[Example]Hereafter, although an example explains this invention further, thereby, this invention is not limited. In this invention, the physical properties of the resin filling constituent were measured by the following techniques, and the evaluation result of the example and the comparative example was summarized in Table 1.

[0028]Mobility: Based on JIS-K7210, it measured on the conditions of the measurement temperature of 190 **, and 2.16 kg of load. Measuring equipment used the melt indexer (product made from treasure industry, and form:L207).

[0029]First [an average of] particle diameter: It measured with the micro track MKII particle-size-distribution meter (SPA the model 7997-20, Nikkiso Co., Ltd. make).

Second [an average of] particle diameter: The diameter of grain of maximum size of the certain direction was measured about 30 particles which carried out random sampling using the scanning electron microscope photograph, and it asked from the average value.

Kneading torque measuring method: The torque value in front of the end of kneading which appeared on the chart was read at the time of resin filling constituent kneading with a lab PURASUTO mill.

Surface disposition: It observed visually. O The surface smoothness fitness of a Plastic solid and x show poor surface smoothness.

[0030]Fire retardancy: Fire lit the specimen of 30x25 mmx0.3mmt by the burner from the lower end, when fire stuck, the burner was promptly removed from the specimen lower end, and time until these all specimens burn was measured.

[0031](Aluminium hydroxide preparing method)

The sodium aluminate solution held in 160 ** of the examples (soda concentration 130 g/l by Na_2O conversion) Stirring to the Na_2O/aluminum$_2O_3$ mole ratio 1.6 by adding 65 g/l of seed aluminium hydroxide with a particle diameter [second / an average of] of 2 micrometers. By adding gradually the presentation sodium aluminate used by about 5-times the amount above, and making a crystallization reaction perform, the slurry containing with 0.1 % of the weight of content Na concentration (Na_2O conversion), the first [an average of] particle diameter of 3 micrometers, and a particle diameter [second / an average of] of 10 micrometers aluminium hydroxide was obtained. After adding water to this slurry and adjusting concentration to 100 g/l, it supplied to the wet medium mill (KOTOBUKI Research Institute Industries make, a trade

name: APEX Mill AM-1 type), and ground on condition of the following.
Grinding media: 2 mmphi zirconia ball 700-ml mill number of rotations : 1800 rpm flow: The second [an average of] particle diameter after 300 ml/min grinding was 4.3 micrometers, and the BET specific surface area was 3.2m^2/g. While super decanters (product made from ********) furthermore perform surface grinding for the slurry after grinding, washing and solid liquid separation are performed, Aluminium hydroxide of 20 % of the weight of water content was obtained (the second [an average of] particle diameter of aluminium hydroxide after surface grinding was 4.2 micrometers, and the BET specific surface area was 4.1m^2/g). Subsequently, aluminium hydroxide after the above-mentioned surface grinding is supplied to the bag of polyethylene, After having added 4% of the weight of stearylphosphoric ester potassium as a finishing agent to this aluminium hydroxide (dry standard) to this, mixing enough by human power and carrying out coating treatment of the finishing agent on aluminium hydroxide, it dried about 120 **x3 hour.
[0032]aluminium hydroxide (the Sumitomo Chemical Co., Ltd. make and trade name:particle aluminium hydroxide C-301R.) of example 2 marketing 0.25 % of the weight of content Na concentration (Na_2O conversion), the first [an average of] particle diameter of 0.9 micrometer, and the second [an average of] particle diameter of 1.6 micrometers were ground on condition of the following using the jet mill (Seishin Enterprise Make, a trade name: KOJIETTO system alpha).

P nozzle pneumatic pressure: -- 7.6 kg/cm^2G nozzle pneumatic pressure: -- 7.6 kg/cm^2 throughput : The second [an average of] particle diameter after 200 g/H grinding was 1.1 micrometers, and the BET specific surface area was 4.9m^2/g. Subsequently, 120g of aluminium hydroxide after grinding was added to 1 l. of sodium aluminate solutions with a Na_2O concentration of 125 g/l which is in saturation at 40 **, churning was continued for bottom five days of temperature up and maintenance at 60 **, and the partial dissolution was performed. the obtained slurry -- solid liquid separation -- washing, the water content of 25%, the second [an average of] particle diameter of 1.3 micrometers, and a BET specific surface area obtained aluminium hydroxide of 4.2 m^2/g. The obtained aluminium hydroxide ranked second and performed the surface treatment by the same method as Example 1.
[0033]The raw material aluminium hydroxide obtained by crystallization in example 3 Example 1 was filtered and washed, and it dried in 120 **x 1 hour. Subsequently, bulk crushing of the obtained aluminium hydroxide was carried out on condition of the following using the jet mill (the Seishin Enterprise make, a trade name: KOJIETTO system alpha).

P nozzle pneumatic pressure: -- 5.0 kg/cm^2G nozzle pneumatic pressure: -- 5.0 kg/cm^2 throughput : The second [an average of] particle diameter after 200 g/H grinding was 1.7

micrometers, and the BET specific surface area was 4.9m^2/g. Furthermore, water was added to this grinding aluminium hydroxide, it was made the slurry of 50% of water content, super decanters performed surface grinding and solid liquid separation, and aluminium hydroxide of 20% of water content was obtained. This second [an average of] particle diameter was 1.6 micrometers, and the BET specific surface area was 9.2m^2/g. The obtained aluminium hydroxide ranked second and performed the surface treatment by the same method as Example 1.

[0034](Production of a thermoplastic resin composition) aluminium hydroxide 150 weight section after the surface treatment obtained by the method Of the above-mentioned Examples 1-3, and a polyethylene bead (the Sumitomo Chemical Co., Ltd. make.) Ultra low density polyethylene, EKUSERENVL VL100, MFR : 100 weight sections for 0.8g/10 minutes, It supplies to a lab PURASUTO mill (made in an incorporated company Oriental energy machine factory, form:30-C150, mixer type:R-100), After mixing, preheating was performed for 5 minutes at 160 **, with the braid stopped, and after the end of preheating, similarly, for 10 minutes was rotated at 160 **, the braid was rotated at 60 rpm, it kneaded, and the thermoplastic resin composition was obtained. The surface disposition of the Plastic solid acquired from the kneading torque at this time and the mobility (MFR) of the obtained thermoplastics, fire retardancy, and this was investigated. The result is shown in Table 1.

[0035]After performing a surface treatment for the same Bayer process aluminium hydroxide as it was with having used in comparative example 1 Example 1 by the same (without it performs grinding treatment entirely) method as Example 1, kneading with resin was performed and the thermoplastic resin composition was obtained. The surface disposition of the Plastic solid acquired from the mobility (MFR) of the obtained thermoplastics, fire retardancy, kneading torque, and this was investigated. The result is shown in Table 1. [0036] surface grinding after grinding according [on comparative example 2 Example 3 and] to a jet mill, and by super decanters -- not carrying out (the second [an average of] particle diameter of this thing was 1.7 micrometers, and the BET specific surface area was 4.9m^2/g) -- water was added and aluminium hydroxide of 20% of water content was obtained. After performing a surface treatment for the obtained aluminium hydroxide by the same method as Example 1, kneading with resin was performed by the same method as Example 1, and the thermoplastic resin composition was obtained. The surface disposition of the Plastic solid acquired from the mobility (MFR) of the obtained thermoplastics, fire retardancy, kneading torque, and this was investigated. The result is shown in Table 1. [0037]

[Table 1]

	MFR g／分	難燃性	混練トルク kg・m	表面性状
実施例1	0．58	良	4．7	○
実施例2	0．59	良	4．7	○
実施例2	0．59	良	4．3	○
比較例1	0．49	良	5．1	×
比較例2	0．28	良	4．9	×

[Translation done.]